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# Three New Species of *Elvasia* (Ochnaceae) from the Brazilian Atlantic Forest, with an Emended Key for Subgenus *Hostmannia*

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**ABSTRACT.** Three new species of *Elvasia* DC. (*E. gigantifolia* Fraga & Saavedra, *E. kollmannii* Fraga & Saavedra, and *E. capixaba* Fraga & Saavedra) from the Brazilian Atlantic forests of Espírito Santo are described and illustrated. The diagnostic characters of each species and their similarities with other species are discussed. In addition, this paper provides an emended key for species of subgenus *Hostmannia* (Planchon) Planchon.

**RESUMO.** São descritas e ilustradas três novas espécies de *Elvasia* DC. (*E. gigantifolia* Fraga & Saavedra, *E. kollmannii* Fraga & Saavedra e *E. capixaba* Fraga & Saavedra) originárias da floresta atlântica brasileira no Espírito Santo. Os caracteres diagnósticos e as semelhanças com outras espécies são discutidos para cada espécie. Em adição, este trabalho apresenta uma chave de identificação para as espécies do subgênero *Hostmannia* (Planchon) Planchon.

**Key words:** Atlantic rain forest, Brazil, *Elvasia*, Espírito Santo, Ochnaceae.

The eastern Brazilian Atlantic coastal forest, although at present highly fragmented, is known as having one of the highest biodiversities on Earth (Myers et al., 2000). Many of these forest fragments of special interest are located on the highland of Espírito Santo.

The Neotropical genus *Elvasia* DC. currently presents 11 species, with 10 species distributed in two subgenera, and *E. brevipedicellata* Ule uncertainly placed in the current subgeneric classification. The subgenus *Elvasia* presents 4 species that are characterized by star-shaped fruits and a distribution concentrated in the Amazon basin; the subgenus *Hostmannia* (Planchon) Planchon has 6 species that

are characterized by globular fruits and a circum-Amazonian distribution. Within subgenus *Hostmannia*, only *E. biseipala* Sastre & Whitefoord extends into Central America and only *E. tricarpellata* Sastre was previously known as endemic to the eastern Brazilian Atlantic forest (Sastre et al., 1999).

As a result of fieldwork in the eastern Brazilian Atlantic coastal forest in Espírito Santo, we have found three new *Elvasia* species, belonging to the subgenus *Hostmannia*, that are described and illustrated in this paper. With the objective of enabling the identification of these species, an emended key for all species of this subgenus is provided.

## 1. *Elvasia gigantifolia* Fraga & Saavedra, sp. nov.

**TYPE:** Brazil. Espírito Santo: Cariacica, Pau Amarelo, Agric. Cond. Cantinho do Céu, limit with State Biol. Res. Duas Bocas, 22 Dec. 1999 (fl), C. N. Fraga 560 (holotype, MBML; isotypes, MO, P, RB). Figure 1.

Haec species *Elvasiae macrostipulari* Sastre & Lescure similis, sed foliorum laminis majoribus (24–35 × 8–9 cm vs. 18–24 × 7–10 cm), petiolis minoribus (0.8–1 cm vs. 1–2 cm), inflorescentiis majoribus (25–30 cm vs. ca. 10 cm) et petalis numero 5 versus 3 ad 4 differt.

Trees 10 m tall; stems glabrous, with lenticels. Leaves 24–35 × 8–9 cm, oblong to elliptic-oblong, coriaceous, base cuneate, apex acute, margin with minute glandular, black teeth, appearing undulate when dry, green; midvein sharply keeled adaxially, prominent and angled abaxially, secondary veins fine and parallel, perpendicular to midvein; petioles 8–10 mm; stipules 5–7 mm, triangular, margin minutely denticulate at base and rigid-fimbriate at apex. Inflorescence erect, terminal, thyrsoïd, 25–30 cm; basal bracts similar to the stipules, distichous and imbricate, 6–9 mm, shallowly triangular, aristate

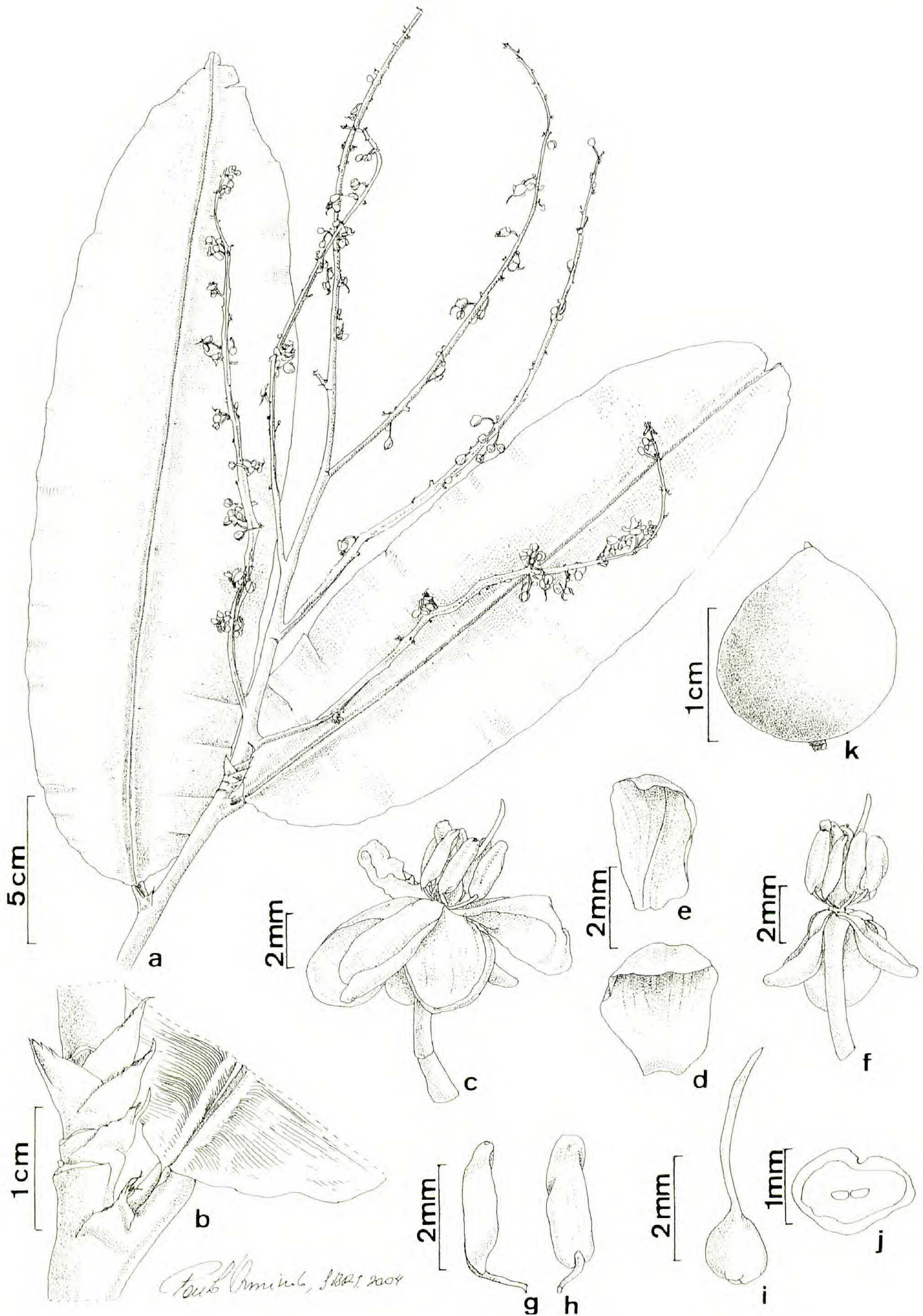


Figure 1. *Elvasia gigantifolia* Fraga & Saavedra. —a. Branches and inflorescence. —b. Stipules and bracts, detail. —c. Flower. —d. Sepal, adaxial side. —e. Petal, adaxial side. —f. Pedicel, sepals, stamens, and gynoecium in side view with petals and one sepal removed. —g. Stamen, side view. —h. Stamen, abaxial side. —i. Gynoecium, side view. —j. Ovary, transverse section. —k. Fruit, side view. a–j drawn from the holotype (*C. N. Fraga* 560, MBML) and k from the paratype (*C. N. Fraga* 627, MBML).

dorsally, apex bifid and fimbriate, often caducous; peduncles 3 to 7, 18–23 cm, distally curved; bract caducous at peduncle base, persistent at the base of the floral clusters, triangular, with cuspidate apex; floral bract triangular, apex cuspidate, 2 bracteoles partially concealed by floral bract; flowers clustered in groups of 2 to 5; pedicels 5–8 mm, articulate near the base. Flowers with sepals 4, glabrous, suborbiculate, externally verrucose, 2 external, coriaceous, 4–5.5 mm diam. and 2 internal, chartaceous, 5–5.5 mm diam.; petals 5, yellow, unequal, imbricate, 4–6 × 2–4.5 mm, obovate, membranous, internally a few somewhat coriaceous at the base and along the central vein; stamens 10 to 11, arranged in a circle around the ovary, occasionally 1 smaller, filaments 0.5–1 mm, anthers ca. 2–2.5 × 0.5–0.6 mm, dehiscence porose, connective dorsiventrally thickened; ovary 1–1.5 mm diam., rhombic, locules 2, 1-ovulate; style 3–3.5 mm, single, erect, flattened, apex appressed. Fruit 2-chambered but more often 1-seeded apparently through abortion, indehiscent, subglobular, ca. 1.5 cm diam., mucronate at the apex.

*Etymology.* The specific epithet refers to the large size of the leaves, which are among the largest in *Elvasia*.

*Elvasia gigantifolia* is similar to *E. macrostipularis*, sharing large leaves over 15 cm long, flowers with 10 or more stamens, and a 2-celled ovary. However, *E. gigantifolia* has leaves that are oblong to elliptic-oblong, exceeding 24 cm; petioles to 10 mm long and stipules 5–7 mm long; the inflorescences are erect, with the branches distally curved, 25–30 cm long; and the flowers have 5 petals. In contrast, *E. macrostipularis* has elliptic leaves, less than 24 cm long; with petioles over 10 mm long and stipules 7–10 mm long; the inflorescences are erect, with no curvature observed, ca. 10 cm long; and the flowers have 3 or 4 petals.

*Paratype.* BRAZIL. **Espírito Santo:** Mun. Cariacica, Pau Amarelo, Agric. Cond. Cantinho do Céu, limit with State Biol. Res. Duas Bocas, 13 May 2000, *C. N. Fraga* 627 (MBML).

## 2. *Elvasia kollmannii* Fraga & Saavedra, sp. nov.

TYPE: Brazil. Espírito Santo: Santa Teresa, headwater of Bonito River, land of the radar of the Aeronautics, 1030 m, 17 Aug. 2003 (fl, fr), *L. Kollmann* 6523 & *C. N. Fraga* (holotype, MBML; isotypes, MBM, MO, P, RB). Figure 2.

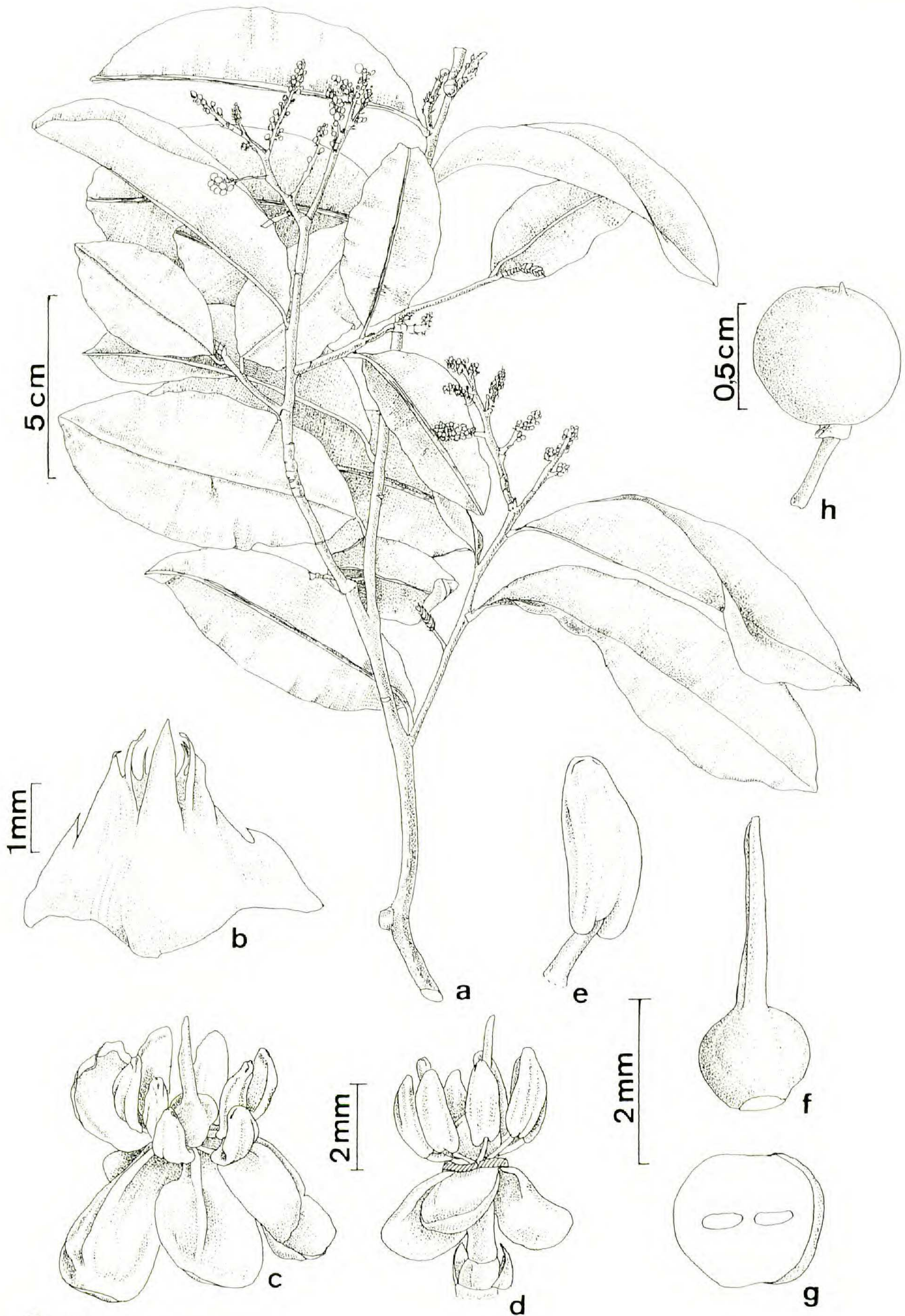
Haec species *Elvasiae elvasioidi* (Planchon) Gilg similis, sed foliorum lamina elliptica, apice acuto usque mucronato et petiolis majoribus (3–5 mm vs. ca. 1 mm), petalis albis, staminibus 8 ad 10 et filamentis antheris minoribus (ca. 0.5 mm vs. 2–3.6 mm) differt.

Trees 9 m tall; stems glabrous. Leaves 5.5–11 × 2.5–4.7 cm, elliptic, coriaceous, base attenuate, apex acute, mucronate, margin with minute glandular, black teeth, appearing slightly undulate when dry, green; midvein sharply keeled adaxially, prominent and angled abaxially, secondary veins fine and parallel, perpendicular to midvein; petiole 3–5 mm; stipules 2–3 mm, triangular, entire or apparently trifid with a stouter central division, appearing tattered and lacinate with age. Inflorescence erect, terminal, 3–13 cm, basal bracts caducous; peduncles 3 to 8, 1.5–6 cm, erect, ramified; bracts similar to the stipules, often caducous, ca. 3–5 mm, triangular, aristate dorsally, apex bifid and fimbriate; bract at the base of the floral clusters persistent, triangular, cuspidate at apex; floral bract triangular, cuspidate at apex, 2 bracteoles partially concealed by the floral bract; flowers clustered in groups of 2 or 3, very shortly pedunculate; pedicel 3–4 mm, articulate near the base. Flowers with sepals 4, externally verrucose, suborbiculate, coriaceous, 2 external ca. 2.5 mm diam. and 2 internal ca. 3 mm diam.; petals 4, white, imbricate, 4–5 × 3–4.5 mm, obovate, membranous, a few somewhat coriaceous at the base and along the central vein; stamens 8 to 10, arranged in a circle around the ovary, the filaments ca. 0.5 mm, the anthers ca. 1.5 × 0.5 mm, dehiscence porose, connective dorsiventrally thickened; gynoecium 4.3–5 mm; ovary slightly flattened, 1.8–2 × 2–2.5 mm, subglobular, locules 2, 1-ovulate; style 2.5–3 mm, single, erect, slightly flattened, apex appressed. Fruit 2-chambered but more often 1-seeded, apparently through abortion, indehiscent and globular, ca. 0.7 cm diam., when young, mucronate at the apex.

*Etymology.* The name of the new species pays homage to Ludovic Jean Charles Kollmann, who has made very important contributions, with his collections, to our knowledge of the flora of Santa Teresa, Espírito Santo state, Brazil.

*Elvasia kollmannii* is similar to *E. elvasioides*, sharing leaves that are less than 15 cm long, flowers with 4 sepals, 8 or more stamens, and a 2-celled ovary. However, *E. kollmannii* has elliptic-coriaceous leaves, with acute to mucronate apex; flowers with white petals, a unique character in *Elvasia*; and stamens 8 to 10 with filaments shorter than the anthers. In contrast, in *E. elvasioides* the leaves are obovate to ovate-elliptic or oblong to oblong-lanceolate, chartaceous, with acuminate apex, and the flowers have yellow petals, with over 15 stamens and filaments that are longer than the anther.

*Paratype.* BRAZIL. **Espírito Santo:** Santa Teresa, headwater of Bonito River, land of the radar of the



*Rub. Amindo, 1873 2004.*

Figure 2. *Elvasia kollmannii* Fraga & Saavedra. —a. Branches and inflorescence. —b. Bract, abaxial side. —c. Flower. —d. Bracteoles, pedicel, sepals, stamens, and gynoecium in side view with petals removed. —e. Stamen, abaxial side. —f. Gynoecium, side view. —g. Ovary, transverse section. —h. Young fruit, side view. a, b drawn from the paratype (*L. Kollmann et al.* 3872, MBML) and c–h from the holotype (*L. Kollmann* 6523 & *C. N. Fraga*, MBML).

Aeronautics, 1030 m, 12 June 2001, *L. Kollmann 3872, E. Bausen & W. Pizziolo* (MBM, MBML, MO, P, RB).

**3. *Elvasia capixaba*** Fraga & Saavedra, sp. nov.

TYPE: Brazil. Espírito Santo: Santa Teresa, Valsugana Velha, Santa Lúcia Biol. Station, right edge of Timbuí River, ca. 19°57'10" to 19°59'00"S, 40°31'30" to 40°32'25"W, 750 m, 13 Aug. 1990 (fl), *S. V. Pereira 23 & M. S. R. Cardoso* (holotype, MBML; isotypes, MBM, MO, P, RB). Figure 3.

Haec species *Elvasiae oligandrae* Cuatrecasas similis, sed foliorum lamina elliptica, coriacea, apice cuspidato vel acuminato, sepalis ovatis, petalis 5, suborbicularibus, staminibus 7, et antheris minoribus differt.

Trees 13 m tall, branches glabrous. Leaves 6–10 × 2–3.5 cm, elliptic, coriaceous, base attenuate, apex cuspidate or occasionally acuminate, margin with minute, glandular, black teeth, appearing slightly undulate when dry, green; midvein inconspicuous, sharply keeled adaxially and prominent abaxially, the secondary veins fine and parallel, perpendicular to midvein; petioles 4–6 mm; stipules 2–3 mm, triangular, trifid with a stouter central division, tattered and lacinate. Inflorescence paniculate on short peduncles, erect, terminal, 6–10 cm, basal bract caducous; peduncles 1 to 7, ca. 1–6.5 cm, erect, ramified, glabrous; bracts similar to the stipules, 2.5–3.5 mm, triangular, at the branch points and at the base of the flowers, aristate dorsally, apex bifid and fimbriate, often caducous; floral bract persistent, triangular, apex cuspidate; 2 bracteoles partially concealed by floral bract; flowers solitary; pedicel 1–1.5 mm, articulate near the base. Flowers with sepals 3, 3–3.5 × 2–2.5 mm, ovate, coriaceous; petals 5, yellow,

imbricate, ca. 4 mm diam., sub-orbiculate, membranous, a few somewhat coriaceous at the base; stamens 7, arranged in a circle around the ovary, the filaments ca. 0.5 mm, the anther ca. 1.5 × 0.5 mm, dehiscence porose; gynoecium 1.5–1.8 mm; ovary ca. 0.5 mm diam., globular, locules 2, 1-ovulate; style 1–1.3 mm, single, base appressed, slightly flattened, somewhat arcuate at base. Fruit 2-chambered but most often 1-seeded apparently through abortion, indehiscent, transversally elliptic, 1.2–1.4 × 1.5–1.8 cm, mucronate at the apex.

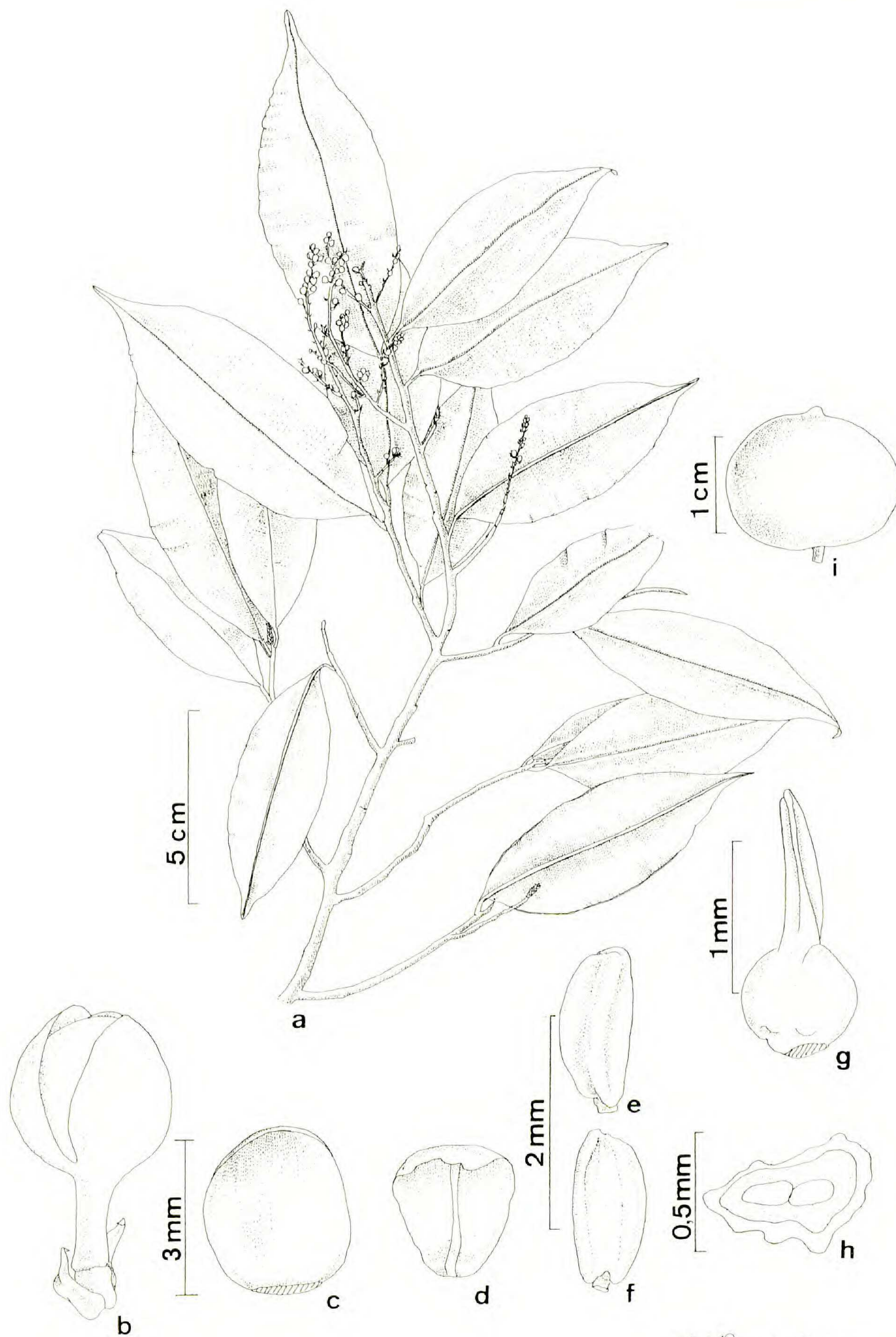
*Etymology.* The specific epithet is a Brazilian Portuguese name of indigenous origin, referring to fertile land. The word is usually used for people born in the state of Espírito Santo, Brazil. The use of “capixaba” is supported by Article 23.2 of the *International Code of Botanical Nomenclature* (Greuter et al., 2000).

*Elvasia capixaba* is similar to *E. oligandra*; both have their leaves less than 15 cm long, the flowers with 3 sepals, 7 or fewer stamens, and a 2-celled ovary. However, the leaves of *E. oligandra* are elliptic-oblong, sub-coriaceous, 8–12 × 3–4 cm, with an acute or occasionally cuspidate apex, and the flowers have elliptic to rounded sepals, 3 elliptic petals, and 5 or 6 stamens with anthers ca. 3 mm long. In contrast, the leaves of *E. capixaba* are elliptic, coriaceous, 6–10 × 2–3.5 cm, with cuspidate or occasionally acuminate apices, and the flowers have ovate sepals, 5 sub-orbiculate petals, and 7 stamens with anthers ca. 1.5 mm long.

*Paratype.* BRAZIL. **Espírito Santo:** Santa Teresa, Valsugana Velha, Santa Lúcia Biol. Stat., 750 m, 3 Feb. 2004, *F. Zamborlini 27* (MBM, MBML, MO, P, RB).

KEY TO THE SPECIES OF *ELVASIA* SUBG. *HOSTMANNIA*

- 1a. Ovary 4- to 5-celled . . . . . *E. sphaerocarpa* R. S. Cowan
- 1b. Ovary 2- to 3-celled.
  - 2a. Ovary 3-celled.
    - 3a. Leaves elliptic to narrowly elliptic, 6–13 × 2.5–4 cm, with apex acuminate-cuspidate, inflorescence terminal on short peduncles, 7–9 cm long, branches minutely pubescent, sepals 2 (rarely 3) . . . . . *E. bisepala* Sastre & Whitefoord
    - 3b. Leaves elliptic to narrowly elliptic, 8–18 × 4–6 cm, with apex acute, inflorescence terminal on long peduncles, 6–20 cm, glabrous, sepals consistently 3 or 4 . . . . . *E. tricarpellata* Sastre
  - 2b. Ovary 2-celled.
    - 4a. Leaves over 18 cm long.
      - 5a. Leaves 24–35 × 8–9 cm, oblong to elliptic-oblong, petioles 8–10 mm long, inflorescences erect, curved in the terminal portion, 25–30 cm long, petals 5 . . . . . *E. gigantifolia* Fraga & Saavedra
      - 5b. Leaves 18–24 × 7–10 cm, elliptic, petioles over 10 mm long, inflorescences erect, ca. 10 cm long, petals 3 or 4 . . . . . *E. macrostipularis* Sastre & Lescure
    - 4b. Leaves to 15 cm long.
      - 6a. Flowers with 3 sepals, stamens 7 or fewer.
        - 7a. Leaves elliptic, coriaceous, 6–10 × 2–3.5 cm, apex cuspidate or occasionally acuminate, flowers with sepals ovate, 3–3.5 × 2–2.5 mm, petals 5, sub-orbiculate, ca. 4 mm diam., stamens 7, anthers ca. 1.5 × 0.5 mm . . . . . *E. capixaba* Fraga & Saavedra
        - 7b. Leaves elliptic-oblong, sub-coriaceous, 8–12 × 3–4 cm, apex abruptly acute and cuspidate, sepals elliptic to rounded, 4–5 × 3–3.5 mm, petals 3, elliptic, ca. 5 × 3 mm, stamens 5 to 6,



Paula Oliveira, JBR 1, 2004.

Figure 3. *Elvasia capixaba* Fraga & Saavedra. —a. Branches and inflorescence. —b. Flower bud. —c. Sepal, adaxial side. —d. Petal, adaxial side. —e. Stamen, side view. —f. Stamen, abaxial side. —g. Gynoecium, side view. —h. Ovary, transverse section. —i. Fruit, side view. a–h drawn from the holotype (S. V. Pereira 23 & M. S. R. Cardoso, MBML) and i from the paratype (F. Zamborlini 27, MBML).

- anthers ca. 3 mm long ..... *E. oligandra* Cuatrecasas
- 6b. Flowers with 4 sepals, stamens 8 or more.
- 8a. Leaves elliptic, coriaceous, 5.5–11 × 2.5–4.7 cm, apex acute to mucronate, flowers with white petals, stamens 8 to 10, filaments ca. 0.5 cm, smaller than the anthers ..... *E. kollmannii* Fraga & Saavedra
- 8b. Leaves obovate to ovate-elliptic or oblong to oblong-lanceolate, 5–15 × 2–5 cm, apex acuminate, flowers with yellow petals, more than 15 stamens, filaments 2–3.6 mm long, larger than anthers ..... *E. elvasioides* (Planchon) Gilg

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